WESTERN DROUGHT, OUTLOOK PROMPT FORECASTERS' CONCERNS

January 21, 2003 — A thin snow pack is raising concerns that stream flows and water supplies will be low for the spring and summer in several Western states, forecasters at the NOAA National Weather Service said today.

In its latest drought assessment, the NOAA Climate Prediction Center said severe drought continues over most of the interior Western states and the central and northern Plains. Conditions ranging from abnormal dryness to moderate drought extend across the Midwest from western Missouri to the Great Lakes. Forecasters added that precipitation is plentiful across the South and Northeast, although drought persists in northern Maine.

"The dryness in the Midwest is expected to continue during the next several months, although lake-effect snows will bring local improvement," said Douglas Lecomte, a NOAA climatologist. "Rain or snow should bring improvement from the Southwest into the central Plains, while little significant change in the drought situation can be expected across the northern Plains and northern and central Rockies," he added.

Water Shortages Possible

Lecomte said the latest outlook raises concern that "serious water shortages" could occur this spring and summer in parts of the northern Rockies and northern Plains, if precipitation continues to be below normal. In contrast, forecast rain and snow later this winter should ease water concerns farther south from Arizona into New Mexico. "Some areas will continue to see low water supplies, even if normal or slightly above-normal precipitation occurs," Lecomte said.

The worst prospects for drought relief are in Montana and Wyoming, which are already mired in a multi-year drought, he added. Spring and summer stream flows are expected to be less than one-half of normal in several river valleys in both states.

Jet Stream Plays Role

"Because the last couple of years have been so dry, even normal snow pack this winter will not be enough to get many western states out of their drought, and snow pack is currently below normal in most states outside of California," Lecomte said.

Additionally, conditions have been unusually dry across much of the Midwest since fall, allowing drought to persist in some areas or expand in others. The winter pattern of an active jet stream dipping southward into the eastern U.S. brought drought-ending rain and snow to the East, but this pattern has left areas in the central part of the country and interior West cut off from Gulf of Mexico and Pacific Ocean moisture sources.

Lecomte said: "We need to see the pattern change so that the jet stream extends farther southward in the Rockies and High Plains. This change shows signs of occurring, at least temporarily, resulting in snow spreading across the Midwest this week."

In recent weeks, El Niño has contributed much-needed precipitation to many parched areas of the country. For example, fall and winter storms along the Gulf and East Coasts have nearly ended the drought from Texas to Georgia, and along the entire East Coast. The precipitation has many wells and reservoirs in the East at near normal levels, with some even above-normal.

Drought Doldrums Continue
Last summer, more than one-third of the nation experienced severe drought, making it one of the most expansive since the devastating droughts of the 1950s.

“Despite major improvement in the East, we still have severe drought covering more than one-fifth of the country, so it will take at least several more months to get back to a more normal situation,” Lecomte said.

The NOAA Climate Prediction Center, one of the NOAA National Centers for Environmental Prediction, is part of the NOAA National Weather Service. The Climate Prediction Center assesses national drought conditions as well as predicts and monitors El Niño. The center also produces the nation’s official long-range outlooks and medium-range weather forecasts.

NOAA is dedicated to enhancing economic security and national safety through the prediction and research of weather and climate-related events and providing environmental stewardship of the nation’s coastal and marine resources. NOAA is part of the Department of Commerce.

Relevant Web Sites
NOAA Drought Information Center

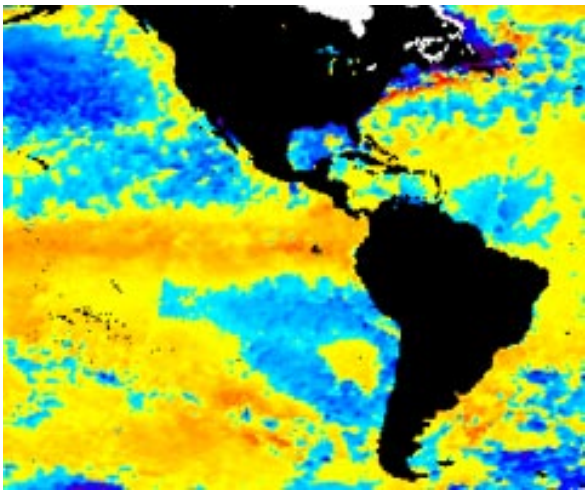
NOAA Drought Products

Animated Indicator Maps for Drought Monitor

NOAA's U.S. Seasonal Outlook (temperature and precipitation)

Media Contact:
John Leslie, NOAA National Weather Service, (301) 713-0622

MATURE EL NIÑO CONDITIONS IN PLACE, NOAA FORECASTERS REPORT



January 9, 2003 — The climate phenomenon El Niño has reached its "mature stage" and will linger through the end of spring, according to forecasters at the NOAA National Weather Service. The NOAA Climate Prediction Center, which issued the latest El Niño outlook today, reported that sea surface temperatures in the equatorial Pacific Ocean remained greater than 1 degree C (2 degrees F) above average in December. Temperatures below the surface were above normal in the eastern Pacific, while cold subsurface temperatures were recorded in the western equatorial Pacific. **(Click NOAA satellite image for larger view of El Niño taken Jan. 6, 2003. The warm sea surface temperatures in the eastern Pacific Ocean are represented in red. Please credit "NOAA.")**

"These sea surface temperatures indicate the mature phase of El Niño is in place," said Jim Laver, director of the CPC. El Niño occurs when sea surface temperatures in the equatorial Pacific Ocean remain above average for more than several months. This usually triggers atmospheric and weather changes around the globe.

Prediction Through March

Forecasters expect El Niño to continue to bring: drier-than-average conditions around the Ohio Valley states and northern Rockies; wetter-than-average conditions along much of the southern tier of the nation and, warmer-than-average temperatures across the northern tier states, southern and southeastern Alaska. **(Click NOAA image for larger view of Climate Prediction Center 2003 seasonal outlook for January-March. Click here for high resolution version, which is a large file. Please credit "NOAA.")**

"Typically, El Niño impacts on the U.S. are strongest during the winter and early spring due to changes in the jet stream, and the pattern of storm activity," said the CPC's Vernon Kousky, NOAA's lead El Niño forecaster. He added this El Niño will continue to remain weaker than the strong 1997-98 version.

El Niño's Benefits

In recent weeks, El Niño has contributed much-needed precipitation to many parched areas of the country. For example, fall and winter storms along the Gulf and East Coasts have nearly ended the drought from Texas to Georgia, and along the entire East Coast.

The precipitation has many wells and reservoirs in the East at near normal levels, with some even above-normal.

Drought Conditions Hang On

In interior sections of the Southeast, some wells and reservoirs still remain below normal. In California, rain and snow have been plentiful. While the snow pack has increased to above-normal levels, drought

conditions remain throughout sections of the interior West and Great Plains.

Drought has continued with little improvement in most of Montana, Wyoming, Utah, Nevada, Arizona and New Mexico. Colorado has experienced early-season snows, but much more is needed for significant drought relief, Laver said.

Also, below-normal rain and snow for the past few months has not brought drought relief for North and South Dakota and Nebraska, and there has been little relief for drought-weary sections of Missouri and Kansas. Drought conditions extend from Michigan into southern Iowa, and could expand both northward and southward in coming months.

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Relevant Web Sites

NOAA's Climate Prediction Center

El Niño/Southern Oscillation (ENSO) Diagnostic Discussion

El Niño to Play Role in Nation's Fall, Winter Weather

Weekly El Niño/Southern Oscillation (ENSO) Update

Most Recent 2 Months Sea Surface Temperature Anomaly Animation

El Niño and La Niña-related Winter Features over North America

NOAA's El Niño Theme Page

NOAA's El Niño Home Page

CLIMATE FACTORS HELPING TO SHAPE WINTER 2001-2002

NOAA's CURRENT SEA SURFACE TEMPERATURE MAPS

ENSO Fact Sheet

ENSO Frequently Asked Questions

ENSO Tutorial

ENSO Recent Events

Sea Surface Temperature Outlook

ENSO Impacts by Region

NOAA's Storm Watch — Get the latest severe weather information across the USA

NOAA's Drought Information Center

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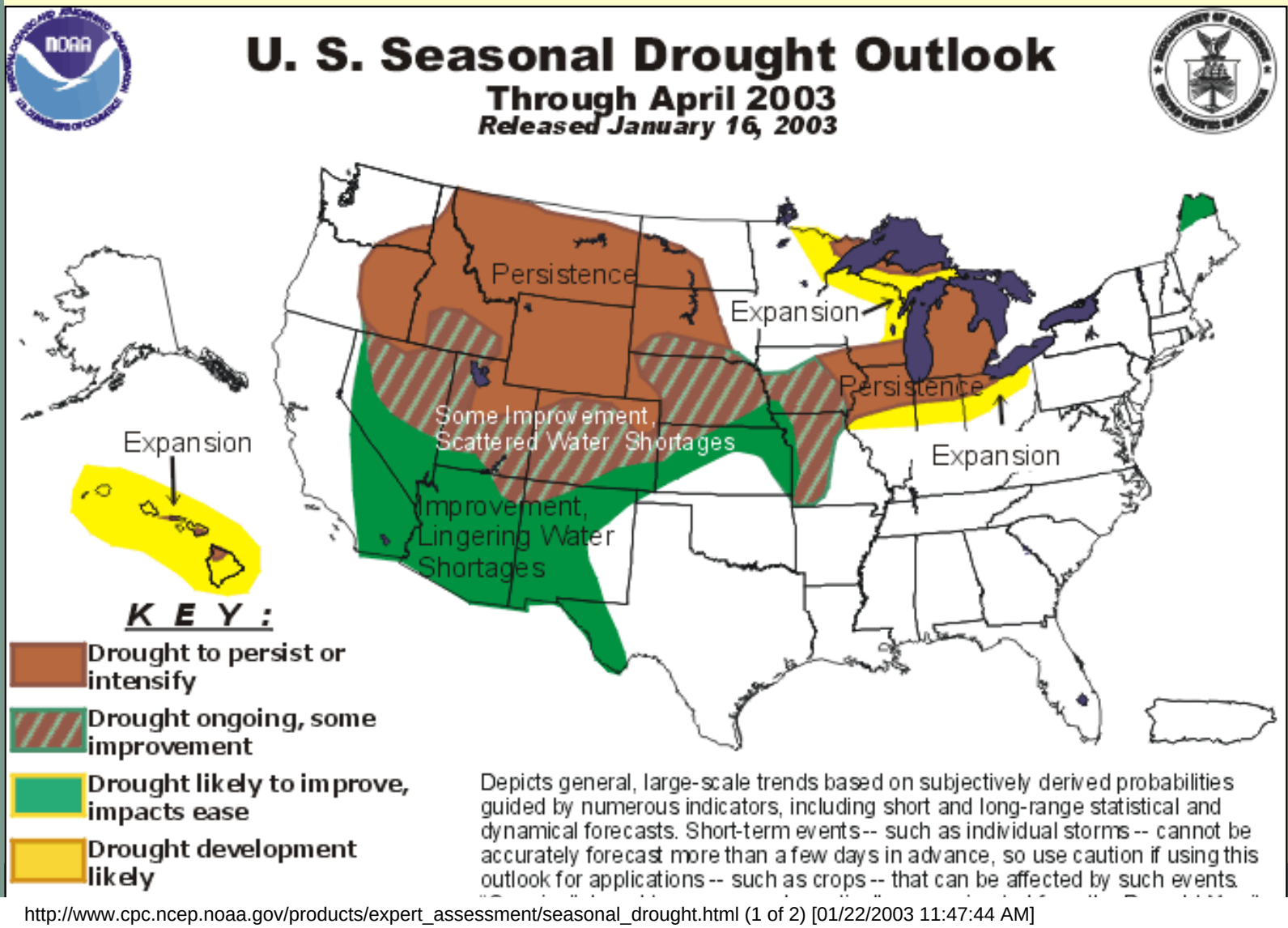
Climate Prediction Center

Skip Navigation Links

HOME
Expert Assessments
Drought Assessment

U.S. Seasonal Drought Outlook



Drought development likely

accurately forecast more than a few days in advance, so use caution if using this outlook for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are schematically approximated from the Drought Monitor (D1 to D4). For weekly drought updates, see the latest Drought Monitor map and text.

Latest Seasonal Assessment - Very dry conditions persisted over the central portion of the nation until a snowstorm crossed the region on January 15-16, offering several states a respite from the dryness. Forecasts suggest that improvement should be continuing for the central and southern Plains during the next three and one-half months, with beneficial rain or snow most likely in Kansas and adjacent portions of Missouri, Nebraska, and Iowa. In contrast, with below-normal precipitation forecast over the Great Lakes region from February to April, drought is expected to continue from northern Illinois into Michigan and northern Indiana and Ohio, with some expansion southward and northward. The exception to the general forecast would be in snow belt areas downwind of the Great Lakes, as cold air over-running the mostly-open waters could trigger locally heavy snowfalls. In the northern Plains, drought is expected to persist from the Dakotas westward into eastern Washington and Oregon and southward into northern Utah and Colorado. Occasional storms will bring periodic breaks in the dry weather pattern, but it does not look like the region will see enough significant precipitation to substantially improve the drought picture. Farther south, the odds for relief improve, as above-normal rain and snow is forecast across the Southwest during February-April. Water shortages will likely continue into April in many parts of the West regardless of rain or snow amounts in the next several months. In the East, drought persists in northern Maine, but improvement is on tap in coming months. Hawaii, on the other hand, should see continued drought expansion.

Drought Outlook Discussion

Publication of the web team, Climate Prediction Center.
Last Updated: 1/16/2003

Climate Prediction Center

Skip Navigation Links

HOME
Expert Assessments
Drought Assessment
Drought Outlook

Discussion for the Seasonal Drought Outlook

Tools used in the drought outlook included: the official CPC long-lead precipitation outlook for FMA , El Niño soil moisture composites, warm ENSO composites for FMA, the Palmer Drought Index probability projections for April, and various medium and short-range forecasts and models such as the 6-10 day and 8-14 day forecasts. For this outlook, an in-house modified version of the Palmer Drought Projections applied to historical El Niño's was given considerable weight.

The forecast for persisting or expanding drought in the Great Lakes region and Ohio Valley is consistent with the below-normal precipitation pattern expected for FMA during El Niños or positive PDO occurrences. The dry signal is especially strong during periods with negative AO, and that is the way this winter is shaping up so far. The forecast is also consistent with last month's drought outlook and recent precipitation trends. Locally heavy lake-effect snows will significantly boost moisture conditions in favored downwind areas, but no attempt was made to account for such local impacts on the national map.

Confidence in the outlook is much less for the Plains states. There is an El Niño or PDO signal for above-normal precipitation in the southern and central Plains, but forecast signals are much weaker or absent to the north in the Dakotas and to the east in Missouri. Past Palmer Drought Index changes during El Niños for this time of year show a tendency for improvement into South Dakota and southern Iowa, and the forecast map reflects this. Somewhat less improvement is shown this month than last month due to recent trends toward dryness, but the mid-January snowfall and the recent shift of the upper level ridge westward are consistent with a wetter pattern.

The outlook for the western states is again largely driven by the FMA precipitation outlook and Palmer drought projections based on previous years with El Niño conditions and similar initial drought indices. The latter tools show a tendency for the drought indices to improve by April across the Southwest. Confidence for improvement is less this month, given the lack of an influx of El Niño-related tropical moisture into the Arizona area so far this season. Also, the SST anomalies for the ENSO 1+2 region off the South American coast are small relative to those near the dateline, and this could reduce the odds of heavy precipitation. Some numerical models also point to below-normal precipitation for the Southwest. A wet pattern is still the best bet, but it is by no means assured. To the north, the forecast for persisting drought across the northern Rockies and interior Northwest is consistent with last month's outlook and recent trends toward below-normal snowfall. The depiction also considered the January 1 spring and summer

streamflow forecasts produced by USDA/NRCS.

In the Northeast, the outlook continues to call for improvement in Maine, based largely on past El Niño composites. Palmer indices tend to improve during El Niño periods in Maine.

In Hawaii, a tendency toward El Niño-related dryness during the February-April period results in a continued forecast of drought development. This is also consistent with recent trends toward expanding dryness.

Publication of the web team, Climate Prediction Center.
Last Updated: 1/16/2003

Climate Prediction Center

Skip Navigation Links

HOME

Outreach

Expert Assessment

El Niño/La Niña Home

EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

CLIMATE PREDICTION CENTER/NCEP

January 9, 2003

NOAA Press Release

Warm episode (El Niño) conditions dominated the tropical Pacific during December 2002. Equatorial SST anomalies were greater than +1°C throughout most of the Pacific between the date line and the South American coast, and exceeded +2°C at several locations between 175°W and 95°W (Fig. 1). Positive subsurface temperature departures (Fig. 2) and a deeper-than-average oceanic thermocline prevailed throughout the equatorial Pacific east of 180°W. Negative subsurface temperature departures were observed west of 180°W at a depth of between 100 and 150 m. This dipole pattern in subsurface temperature anomalies is a typical feature observed during the mature phase of El Niño.

Atmospheric indicators of El Niño include consistently negative values of the Tahiti-Darwin Southern Oscillation Index (SOI) since March 2002, and weaker-than-average low-level easterly winds since May 2002 throughout the equatorial Pacific. Notable climate anomalies during October-December 2002, consistent with the ongoing El Niño, include: drier-than-average conditions over Indonesia, northern and eastern Australia, Central America and northeastern South America and wetter-than-average conditions over the central equatorial Pacific, southeastern South America and the southeastern United States (Fig. 3).

Values of atmospheric and oceanic indices, such as the SOI, 850-hPa zonal wind index, Niño 3.4, are all considerably less in magnitude than those observed during the 1997-98 El Niño (Fig. 4). Collectively, oceanic and atmospheric indices are indicative of a moderate warm (El Niño) episode.

Most coupled model and statistical model forecasts indicate that El Niño conditions will

continue through the northern spring of 2003. Thereafter the forecasts are more uncertain, during a time of the year when all of the techniques have difficulty in making skillful forecasts. A critical factor governing the duration of the current warm episode is the rate of evolution of the dipole pattern in the subsurface thermal structure along the equatorial Pacific, which is linked to the persistence and eastward extension of the pattern of deep convection into the eastern Pacific and the intensity and persistence of low-level westerly zonal wind anomalies. The Climate Prediction Center will continue to monitor these features over the next few months.

Expected global impacts of the warm episode include: 1) drier-than-average over most of Indonesia, Micronesia and northern/northeastern Australia continuing during the next three months, 2) drier-than-average over southeastern Africa during January-March 2003, 3) drier-than-average over Northeast Brazil and northern South America during January-April 2003, and 4) wetter-than-average conditions over coastal sections of Ecuador and northern Peru during February-April 2003. Over the United States and Canada, during the remainder of the northern winter, expected conditions include: 1) drier-than-average over the Ohio and Tennessee Valleys, the eastern Great Lakes, and the northern U.S. Rockies, 2) wetter-than-average along much of the southern tier of the U.S., and 3) warmer-than-average in the northern tier states, southern and southeastern Alaska, and western and central Canada.

This discussion is a consolidated effort of NOAA and its funded institutions. Weekly updates for SST, 850-hPa wind, OLR and features of the equatorial subsurface temperature structure are available on the Climate Prediction Center web page at http://www.cpc.ncep.noaa.gov (Weekly Update). Forecasts for the evolution of El Niño/La Niña are updated monthly in CPC's Climate Diagnostics Bulletin Forecast Forum. To receive an e-mail notification when updated ENSO Diagnostic Discussions are released please send your e-mail address to:

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